## SUMMARY

**The effectiveness of post activation potentiation (PAP) on sprinting performance.**

The three presented empirical papers which consist the scientific achievement attempted to evaluate the effectiveness of post activation potentiation (PAP) on sprint performance. Several independent experiments were conducted with highly qualified male and female sprinters with the use of reliable apparatus as well as standardized measuring conditions which were guaranteed by indoor facilities with a synthetic track approved by PZLA. The choice of activation exercises was based on previous research, which indicated a greater transfer of force in resistance exercises that had a similar movement structure as the explosive activity which followed. In this case it was the sprint. The validity and the reliability of the apparatus used in the experiments (Sprint 1080 AB Sweden, photocells, Witty Microgate, Italy) was confirmed empirically earlier. To avoid methodological errors the study participants were given the chance to familiarize themselves with activation exercises and testing procedures. All testing procedures were preceded by an individualized competition warm-up, and the evaluations were conducted at the same time of the day.

The first study indicated that the resisted sprints, applied as a conditioning exercise activating PAP allow for acute improvements of sprinting speed at a distance of 20m from a flying start and its effectiveness depends on the provided load. A single 10% body mass loaded sprint over 20m enhances performance over 20m from a flying start. In the second study, while using the Sprint 1080 device we attempted to evaluate the optimal load of resisted sprints for the developments of power without compromising running technique. The results indicated that loads between 8 and 13% body mass were optimal for generating power with a minimal decrease of sprinting speed. In the third experiment we compared the effectiveness of loaded and assisted sprints as conditioning exercises on starting and maximal running speed. The activation with loaded sprints (10% BM) caused acute enhancement of sprint performance at both 10m and 50m. The use of assisted sprints with supramaximal intensity (113% max) did not improve sprinting performance significantly at neither 10m nor 50m. It was concluded that the study participants were familiar with resisted sprints, while most of them did not use overspeed training before and faced coordination problems with supramaximal running speeds and thus did not improve their sprinting performance.